some cases easily happen that the apex of the prostate is also cut, although in the case in which the patient died it was found entire. I now take hold of the handle of the catheter, and passing my left fore-finger into the wound, feel the groove exposed; and as others would pass some form of gorget through the prostatic portion of the urethra and neck of the bladder, I only introduce my finger into the bladder, being certain it never can make a false passage, since I keep it in contact with the metallic instrument. I take care, nevertheless, not to pass my finger along the groove, because I should then thrust it against the internal or posterior angle of the wound, and then against the great bulk of the prostate. Scarcely do I touch the groove before, instead of following it, I pass my finger upon the right side of the staff (as regards the patient) and carry it quietly and without any obstacle into the bladder. One of the advantages of this modification is, that it enables me, in most cases, to come at once in contact with the stone.

"I then remove the staff, still, however, retaining my finger within the track of the incision, and gently moving it about in a semi-rotatory manner, effect a much greater dilatation of the prostatic urethra and neck of the bladder. Next, I pass in the forceps behind my finger and seize the stone. It has to pass along a track of only from 12 to 15 lines, or even less, since the inverse cone formed by the forceps approximates the neck of the bladder and urethral aperture, for which reason the space is shorter and more easily dilated. I remove the stone with two, or at most three semi-rotations, performed with circumspection and care, along an axis, which, commencing at the centre of the bladder, should pass through its neck, and following the centre of the prostatic urethra, terminated in the centre of the perineal aperture.

"I am in general not more than a minute after opening into the urethra before I have extracted the stone, and the operation has always succeeded in my hands. Safety, simplicity, and celerity, I have already said are desiderata of every operative process, and I am in a condition to prove that they attach to this one recommended by me. All I employ are simply a bistoury and the forceps—*simplicity*, surely, in comparison with the multiplicity of complicated instruments which has been recommended in the various and numerous modes of performing *Cystotomia*. By passing my finger along the staff, I secure that *safety* which is not usually a characteristic of operations for stone. It is related that even the celebrated Scarpa passed the gorget, which was looked upon as the palladium of his fame, in between the bladder and the rectum. The same thing has occurred to many otherwise skillful operators. * * * * I am certain of not injuring either the pudendal artery, the prostatic venous plexus (so frequently in a varicose condition in the aged), the body of the bladder, or the rectum. Farther, by the preservation of the whole, or nearly the whole, of the prostatico-vesical canal, inflammations between the rectum and bladder are avoided, inasmuch as urinary infiltration is prevented, in consequence of the prostate not being divided. * * * * * The *rapidity* of the operation is shown by the fact, that instantly after I have opened the urethra I have the stone in my hand; and any one who has ever once performed this operation, will bear witness to my assertion. I may observe that it seems almost impossible that so many operators, at all periods, have written so much, and cudgelled their brains to invent new operative procedures for lithotomy by deep prostatico-cystic incisions, while, with a simple *urethrotomy*, the desired end may be obtained, as I can prove by so many cases."

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48. *Lithotrity.*—M. Cazenave, of Bordeaux, read to the Academy of Medicine of Paris, Nov. 11th last, a short statistical notice relative to the operations of lithotrity, performed by him during the past fifteen years. The number of these operations was 52. Of these 43 were entirely successful, 8 terminated fatally; one patient alone continued to suffer after the operation, although he had been relieved of two large calculi. Of the 8 fatal cases, in 3 death resulted from causes entirely unconnected with the operation. The details of these 3 last cases were given. —*Gaz. Med. de Paris*, Nov. 15, 1845.

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49. *On Lithotrity as a means of removing stone from the bladder.* By Sir Philip Crampton, Bart., F. R. S., &c. &c.—If there is one subject more than another on

which surgical opinion is divided, that subject is assuredly lithotrity. Where, I would ask, is the young practitioner, desirous of being on a level with the improvements of the age, and, at the same time, feeling the want of a guide for his practice, to seek for information on the subject? In the systematic works he will find the highest authorities in direct opposition to one another, not merely on matters of *opinion*, but on the *facts* on which those opinions must be based. If, turning from statistics which point to directly opposite conclusions, according to the views of the parties by which they are used, he endeavours to collect the opinions of practical men, his embarrassment is only increased, professed lithotritists, on the one hand, and hospital surgeons, on the other, taking very different views of the subject—the lithotritists maintaining that the new operation is applicable to almost every case of stone, is unattended with any considerable pain, and is *when properly performed*, quite devoid of danger—the hospital surgeons denying all this, and asserting that lithotrity is applicable to a very limited number of cases, that it is to the full as painful and far more fatal than cystotomy.

Now, when it is considered that lithotrity has been practised in a vast number of cases, both in Europe and America, for more than twenty years, it might be supposed that there were ample data to enable us to arrive at something like a conclusion as to the real value of the operation; unhappily, however, this is far from being the case, and the question as to which operation should be the rule, and which the exception, seems as far from being settled as ever.

Dupuytren, himself a celebrated cystotomist, and the inventor of the bilateral operation, was, as may be easily imagined, anything but friendly to the new operation. The cases successfully operated on in his presence, by M. Civiale, induced him to mitigate his sentence, but his hostility was not the less determined, and in his "Report" to the academy in 1831, he took so unfavourable a view of the subject, as induced the academy to withhold for another year the great prize which had been adjudged to Civiale for his discovery in the year 1827. This proceeding on the part of Dupuytren gave occasion for the celebrated letter addressed to him by Civiale, in which I am bound to say that the castigation—the most severe that, I think, is to be found in the whole circle of medical polemics—is scarcely more than the occasion justified.

As a mode of determining the relative value of the old and new operation, Dupuytren then suggested that a correct list should be made out of the total number of persons operated on by lithotrity and cystotomy within a certain period, and that a comparison should be made (upon equal numbers) of cures and deaths resulting from each mode of treatment respectively; and in this way he conceived that the question as to which operation should be considered as the rule, and which the exception, would be solved at once. M. Civiale at once accepted the proposal, and carried it out with an industry and ability which are above all praise: his tables presented to the academy contain no less than 5661 cases of calculus in the bladder, all classified and detailed with a degree of accuracy which has never before been attempted. But alas for human nature as well as for medical statistics! the humiliating truth remains to be told: each party affirms, and brings forward official documents to prove, that his adversary's lists of cures are not to be relied on. In France, it would appear (on the testimony of M. Amussat) that the statistics of operations are but too like the statistics of battles, each side diminishing the number of its own killed and wounded, and exaggerating the killed and wounded of the enemy. In justice, however, to M. Civiale, I am bound to say, that upon a careful and certainly unprejudiced examination of the whole controversy, the impression on my mind is, that the great "Inventor of Lithotrity," (I give him the title conferred on him by the Academy of Sciences) has not been quite fairly dealt with; and if all the charges brought against him have as little foundation as one which I am enabled of my own knowledge to refute, he must stand fully acquitted of misrepresenting the amount of his success. The late Mr. Henn, of Merion-square,—from whom Sir Astley Cooper had extracted some fragments of calculi by means of his forceps in the year 1824,—consulted M. Civiale in 1827, who ascertained, by sounding, the existence of several calculi in the bladder, complicated with extensive disease of that organ, and of the prostate: he dissuaded him from undergoing lithotrity or any other operation, at least under existing circumstances, and placed him under the care of Dr.

Morgan. Mr. Henn returned to Dublin, where he lived for several years, but never underwent *any* operation. At a sitting of the Royal Academy of Medicine, on the 3d of January, 1828, the name of Mr. Henn appears among the number of those who had been operated upon by M. Civiale, and had died of the operation!

Most unsettled, however, is the state of opinion *in this country* respecting the comparative value of lithotomy and lithotrity. Much of the prejudice which is entertained against lithotrity is founded on the exaggerations of professed lithotritists, whose interest it was to represent the operation which they exclusively practised as absolutely devoid of pain and danger, while the operation of cystotomy, as practised by hospital surgeons, was painted in the most terrible colours. The hospital surgeons, a few of whom enjoyed a monopoly of cystotomy, received, as they well might, with distrust, the glowing accounts of the successes of the new operation, and with anger and disgust what they considered as an exaggerated picture of the horrors of the old.

Hear M. Civiale's account of the operation of cystotomy, which, for power of description, is, I think, without a parallel:—

"The operation is rarely performed in the chamber occupied by the patient. On entering 'the operation room,' which he has been accustomed to consider as 'the place of his execution,' the sight of the raised and covered table, the crowd of assistants, the preparations, all suggest the idea of the scaffold, and are enough to carry terror into the stoutest heart; the terrible array of instruments, mysteriously concealed from his view, but ever present to his mind, the painful, but still more terrific posture in which he is placed on the table, the cords with which he is to be bound hand and foot, the shaving of the part on which the operation is to be performed,—all these circumstances, less serious in themselves than in the fears which they foment, fill the unfortunate sufferer's mind with terrors which increase every moment. Some, unable to support even the sight of so awful a spectacle, fall senseless on the ground; others, as happened lately in the hospital at Pavia, fly from the room, and absolutely refuse to submit to the operation. On his side, the surgeon is far from feeling at ease. 'Does he know, (observes Dechamps,) is he absolutely certain of what he has to do? Can he foresee all the obstacles that may present themselves? No doubt the rules are all clearly laid down, but their application is so subject to vary, that from this source alone the most insurmountable difficulties may result. The practice of the greatest surgeons is before us to attest the fact, and even in our own days we have a sufficient number of instances to convince us of the truth of it; hence it is that cystotomy has ever been, and must for ever remain, in the hands of a few surgeons, who often derive from their experience resources that genius and knowledge would fail to supply."—*Parallèle des divèrs Moyens de traiter les Calculeux.* Paris. 1836.

M. Civiale then proceeds to give three fatal cases of cystotomy, attended with the most terrible sufferings; one from his own practice, one from the practice of Covillard, and one from Dupuytren's. In one, (Covillard's,) "after two hours of the most horrible torments, during which several pairs of forceps were bent or broken, when the patient was so exhausted as to be able to utter only some feeble moans, and when his last breath was about to depart with the last drops of his blood, he was unbound and laid in bed, where he expired in the course of an hour." These terrible, but, I fear, not too highly-coloured details, though calculated to increase the horror in the public mind against cystotomy, are clearly chargeable, not to the operation, but to the operator. The cause of these disasters was the attempting an operation which was impracticable, from the great size of the stone; and the surgeon who, from culpable ignorance, committed the mistake, should have been tried for manslaughter for persisting in it, "contrary," as Civiale states, "to the urgent request of all the bystanders. But," he adds, "he was not to be dragged from the altar or from his victim." Such a scene, I rejoice to say, at least within my time, has never been witnessed in this country.

The publication of such cases, however, was all in favour of the new operation. The public, with mind pre-occupied and shocked by such details, hailed with delight the announcement of an operation, "which," to use the expression of Baron Heurteloup, "was almost entirely free from danger and pain."

Now, strange as it may appear, I do not hesitate to say, and I am in a condition to prove to you, that this is not too favourable a picture of lithotrity, *if the operation* *be properly performed, and restricted to those cases which come within its proper domain;* but if applied generally to lithotrity, *as a substitute for cystotomy*, it is lamentably untrue. This, however, is a distinction which the public could not make, and the new operation was accordingly hailed by them as "a gift from heaven."

But it becomes the duty of every hospital surgeon who has availed himself of the opportunities which have presented themselves of performing the new as well as the old operation, to give the results of his practice to the profession, and that too in such a way as to leave no room for cavil as to his statistics. This can be done but in one way, and that is, to give a nominal list of *every patient* whom he has treated, stating the particulars of each case, the immediate results of the operation, and the actual state of the patient after an interval of many months, and, if possible, of years. The surgical profession and the public are under infinite obligations to Mr. Key, for having led the way in this true path of inquiry. Himself one of the most expert and successful of living lithotritists, he has studied the operation of lithotrity, and brought to its performance the most consummate skill, based on a most extensive experience. Following his example, I have determined to give, on the present occasion, the result of my personal experience in lithotomy and lithotrity, which extends over a period of upwards of forty years, during which time I have seen the operation performed, both in these countries and in France, by the most celebrated surgeons who have lived during the last half century, and I have myself operated on sixty-eight individuals,—on forty-nine by lithotomy, and on nineteen by lithotrity, and on two of these by a combined operation consisting of lithotrity and cystotomy, or rather, by what Mr. Willis calls lithectasy, that is, by opening the urethra at its membranous part, and dilating, but not dividing, the neck of the bladder, and extracting from the bladder the fragments of the calculus, which had previously been crushed by the lithotrite.

The origin of lithotrity, like the origin of many of the inventions which exercise the greatest influence on human happiness, is involved in darkness; but beyond all question, to Civiale is due the honour of having first constructed and successfully applied an instrument for the crushing or reducing to powder a stone in the bladder of a living man.

Four cases which came before my own eyes determined me to know something more of lithotrity. I therefore proceeded at once to London, and waited on Baron Heurteloup, to witness his mode of operating, with a view of practising it myself. He received me with the utmost liberality, and brought me to witness an operation on Admiral Cumberland. The operation was performed with Civiale's three-branch instrument, for the baron had not then employed his *percuteur a marteau.* Nothing could exceed the dexterity and skill, unless it be the gentleness, with which it was performed. I supplied myself with the instruments, and, after making some trials on the dead subject, I satisfied myself that the operation was applicable only to a very limited range of cases, and that even in the most dextrous hands it was likely to prove as dangerous as it was difficult. I determined, therefore, never to attempt it. The invention, however, of the two-branch *percuteur* changed the whole character of the operation, and with it changed my resolution, so I immediately procured one, and laid myself down to the study of it. Respecting the invention of this admirable instrument, conceding, as we are bound to do, to Civiale, if not the discovery, at all events the application of lithotrity, I would assign to Heurteloup the merit (scarcely inferior to that of Civiale) of having invented lithotripsy, that is to say, the seizing of the stone with a two-branch curved instrument, instead of a three-branch straight one, and reducing it to fragments by means of repeated blows of a hammer. This is the *percuteur courbe a marteau* of Heurteloup, and it is, beyond all comparison, the best instrument that has as yet been invented for pulverizing calculi in the bladder; and this is true, whether the effect be produced by percussion, when the branches are closed on the stone, by the blows of the hammer, or by compression, as when they are closed by the action of a screw. The best proof of the superiority of the *percuteur* to the three-branch instrument, is the fact that it is the instrument which is now exclusively employed by Civiale, and by every lithotritist in Europe and America. In justice to a most ingenious artist, it is but fair to state, that an instrument in all material points identical with the Baron Heurteloup's was invented by Mr. Weiss, of London, so early as the year 1824. Whether or not this instrument suggested the curved *percuteur* to the baron is more than I will decide. We have the evidence of Sir B. Brodie as to his having seen the instrument with Mr. Weiss in 1824.

To return to my narrative. Furnished with a *percuteur*, I had not long to wait for an opportunity of employing it. In February, 1834, a man named Doyle was admitted into the hospital with a small stone in the bladder; he was thirty-five years of age, and seemed in perfect health. When I told him that I intended to endeavour to remove the stone by breaking it up in his bladder, without cutting him, he seemed transported with joy. I then began by preparing a subject in such a way that I could look into the bladder while manipulating with the instrument: this can be done, when the anterior wall of the abdomen is removed, by cutting away the upper fundus of the bladder, and keeping the opening distended by stitching the cut edges to a ring of strong wire about three inches and a half in diameter. By practising on a subject so prepared, or even on a well-stuffed cushion, on the centre of which the calculus may be laid, you will soon discover a knack (which very few lithotritists have, so far as I know, as yet made public,) by which you can, while your eyes are closed, catch the calculus with certainty at the very first attempt.

After a few days' practice in this way, I performed the operation in the Meath Hospital, March 7th, 1834. The stone was seized, and broken by means of a small hammer; repeated on the 10th; the whole detritus discharged before the 14th; on the 18th the man returned to Waterford, and has had no return of his complaint. This is the first case in which lithotrity was performed in this country (Dublin); it is now more fully adopted, and its true value in course of being duly appreciated.

Now, what is the problem which lithotrity has to solve? It may (according to Civiale) be conveniently stated under the following heads:—

1st. The reducing of calculi within the bladder into fragments sufficiently small to be discharged or removed through the natural passage.

2dly. The effecting this by such means as shall excite no dangerous irritation in the urinary organs.

3dly. The freeing the bladder or urethra from the fragments which these organs may not have the power to expel.

To effect these objects, the instrument should combine a sufficient strength, with a form and dimension which will admit of its being passed through the urethra without exciting any considerable irritation: let us see how these desiderata are fulfilled by the instruments now in use. I need not detain you by a detailed description of various instruments, for all instruments are rendered obsolete by Heurteloup's or Weiss's curved *percuteur*.

The *percuteur* has undergone several alterations and some improvements, but I consider that the most important improvement is the provision for preventing the accumulation of detritus between the jaws of the instrument. I early perceived this great defect, and applied to one of the most ingenious mechanics that any country has produced, to remedy it, (the late Mr. Oldham.) The invention has been claimed by many, but here is the original instrument, made in 1834, which I have used ever since.

The preparation of the patient is general and special.

The general consists in light diet, abstinence from fermented liquors, free bowels without purging, the use of the hip-bath; if the urine be acid, administering alkalies combined with uva ursi or Peruvian bark, and Vichy water; mineral acids when the urine is alkaline, and the infusion of Pareira brava when there is mucous deposit; also absolute rest, with occasionally anodyne enemata.

The special preparation may be summed up under the heads of gradual dilatation of the urethra, when necessary; division of its orifice, when preternaturally contracted; and the frequent introduction of the catheter; on this latter I lay the greatest stress, as, if properly conducted, it allays the irritability of the urethra and the bladder. [Here the lecturer demonstrated the position of the patient on Heurteloup's bed, and proved that a fixed point in the instrument is not only unnecessary but dangerous. He also showed the mode of injecting the bladder, cautioning his hearers against the too rapid introduction of the fluid—more than one fatal case having arisen from this cause. In executing this manœuvre, the water should be so slowly introduced as to imitate, in some degree, its descent from the kidneys. The various steps of seizing the stone were gone through, as well as the removal of detritus from the bladder, by means of the lecturer's exhausting apparatus, and the mode of removing fragments from the urethra by cutting down upon them, as well as by means of Leroy's jointed curette.] So much, then, for the purely *mechanical* part of lithotrity, on the dextrous and delicate performance of which, much, no doubt, of the success will depend. In calculating, however, the probable *result* of the operation, there is a far more important element to be taken into account—namely, its proper adaptation to the case. If from a too exclusive admiration of lithotrity, founded on the exaggerated representations of some of its advocates, uncorrected by an extended experience, lithotrity be applied to a case to which it is inapplicable, and that properly comes within the province of cystotomy, the certainty is that the operation will fail, and the probability is that it will prove fatal; and to a certain, but not to so great an extent, the converse is true; if, for instance, lithotomy be performed on a person labouring under phthisis, extensive disease of the liver, or kidneys, it will certainly prove fatal. Such cases are not likely to succeed when treated by lithotrity; still they *may* succeed, and if the stone be small, and the bladder tolerably sound, the probability is that they will succeed, and life may not only be prolonged, but, what is scarcely less desirable, what remains of it may be spent in comparative freedom from pain. Again, if perineal cystotomy be attempted in a case where the size of the stone is so great that it either cannot be extracted through the lower opening of the pelvis at all, or without employing such violence as to render the operation almost certainly fatal, then lithotrity affords a means of relief, whether applied alone or in aid of cystotomy or lithectasy.

It appears, then, that cystotomy and lithotrity are not to be considered as rivals, and that the question, as to which of the operations should be the rule and which the exception, should never be brought into discussion; each operation has its special province, the boundaries of which (if, indeed, they admit of being fixed at all) can be determined only by a comparison of a vast collection of facts, carefully noted, and, above all, faithfully reported, and properly authenticated.

If we look to the state of professional opinion in France, we find M. Velpeau, the most able, eloquent, and determined opponent of lithotrity, admits, that in cases of small stones, and even of large ones, if they be friable, and the bladder and its appendages be healthy, lithotrity is the preferable operation: but in all cases of children under fifteen years of age, and even in adults, where the stone exceeds in volume a small nut, and is of excessive hardness, and when the urinary organs are in a state of disease, as evinced by catarrh of the bladder, contracted or irritable urethra, then he would prefer lithotomy. Amussat, Lisfranc, Dubois, and Leroy, on the contrary, are vehement supporters of lithotrity; they would apply it to almost every case admitting of any operation, even to children and infants. M. Civiale, however, though sufficiently partial to what may fairly be called his own operation, is far from applying it indiscriminately. Now, what is the state of opinion on this subject in England?

Sir B. Brodie's opinions are recorded in his lectures on the diseases of the urinary organs. "You should be made acquainted," says this sagacious practitioner, "with the unfavourable circumstances which may attend on this mode of treatment: but you are not to suppose that it often happens that these exist to any considerable extent. The new operation often presents great advantages over lithotomy. It would be a great error to represent it as preferable on all occasions, but it is so in a great many instances."

Mr. Liston, himself one of the most distinguished and successful lithotomists in Europe, is, naturally enough, strongly prepossessed in favour of an operation in which he so much excels. His opinion of lithotrity is, therefore, far less favourable than Sir B. Brodie's. He is not so sanguine "as to suppose that the breaking up of the stone in the bladder will ever entirely supersede lithotomy. If, by some miraculous interposition of Providence, the deposits from the urine should uniformly be pulverizable, and that bladders be made of less irritable stuff than they are, and if, above all, the affected individuals could only be prevailed upon to apply in due time, then might such pleasant anticipations be entertained, and then might we, with some reason, hope to see them realized; but as matters now are, urinary concretions must, in a great many instances, be cut out of the bladder. Nor is it a circumstance to be very much deplored, since, in good hands, the patient neither endures so much suffering, nor incurs so much risk, as by the proceedings already detailed. The cure, besides, is far less tedious. The stone-grinders, whilst they conceal their own unfortunate results, endeavour to depreciate lithotomy by blazoning abroad the practice of some unlucky surgeon, who, perhaps, loses four in twelve, or six in twelve, of the patients who come under his knife." Mr. Liston acknowledges that now "the screw lithotrite can with great propriety and safety be employed in cases in which the concretion has not attained any very large size, and in which also the urinary apparatus is healthy, and tolerably free from irritability. The cases for this operation must be well chosen, and the proceedings conducted throughout with great caution, gentleness, and judgment."

The last book which has been published on the subject is the work of a well-informed physician—Dr. Willis. It is altogether opposed to the opinion and practice of Sir B. Brodie, and of several other hospital surgeons of high reputation, and particularly of Mr. White, of the Westminster Hospital. The *author* does not, I believe, draw from any fund of considerable personal experience. Speaking of the supersedence of the cutting operation, he says, "Such a substitute was, in its first introduction, and for some considerable time afterwards, believed to have been discovered in lithotrity. But this is beyond all question a rotten staff, which, leaned upon by all who suffer from stone, will certainly fail five-sixths of the number; nearly one-half will find that it is totally inapplicable to their case; from one-third to one-fourth will fall immediate victims to its determined application; and from one-third to one-fourth will escape, to lead miserable lives from diseased bladder, and then die of diseased kidneys: not more than one in three or four of all who were held favourable subjects will find it a safe, effectual, and final remedy for their disease. The public and professional mind has been singularly abused in regard to the value of lithotrity, as a general means of treating stone in the bladder." This is a terrible picture; nevertheless, I believe, if applied to lithotrity, considered and *employed* as a *substitute* for lithotomy, it is not too highly coloured. Dr. Willis supports his opinion by a reference to what he considers as *authentic* documents, (for when *unfavourable* to the operators, and given by themselves, they may be safely so considered.) From a great number of unsuccessful instances, collected from various authentic sources, Dr. Willis arrives at this conclusion respecting the circumstances in which lithotrity is admissible, and those in which it is inadmissible. "Lithotrity," he says, "is admissible, *and only admissible*, in cases in which the bladder is perfectly healthy, and in which the stone is small, of the size of a filbert, a shelled almond, or it may be a nutmeg at the utmost; under all other circumstances, it ought to be held impracticable. In other words, lithotrity is admissible where it is estimated that the stone can, at one sitting, be seized and reduced to fragments of sufficient minuteness to be passed by the urethra. No second, certainly no third operation ought ever to be contemplated; *if the patient who has had lithotrity performed on him is not relieved at once, he is in imminent danger of losing his life.* Lithotrity, I do not hesitate to say it, has now been fairly tried, and found wanting as a general means of relief for stone. Restricted to the circumstances just indicated, it is a great addition to our chirurgical therapeia; applied indiscriminately, and as a substitute for lithotomy, and all other means of dealing with stone in the bladder, it is a most fatal present made to humanity." But Dr. Willis draws his conclusion from documents which have reference chiefly, if not altogether, to the original operation with the three-branch instrument, and the drill, as first practised by Civiale; though even then, his picture is too highly coloured; but if applied to the operation as *now* performed with Heurteloup's *percuteur*, it is far from being a correct representation of lithotrity; and this I am in a condition to prove upon evidence which I am not afraid to say is the most exact that has as yet been offered on any disputed point of surgical practice. I propose to take the last eleven years, and to give every case of stone in the bladder on which I was consulted during that time, the particulars of each case, including the operation (if any) which was performed for its relief, and the issue up to this day, constituting a catalogue *raisonné* of all the cases, whether treated by lithotrity or cystotomy.

From May, 1834, to September, 1845, I have had to deal with thirty-five cases, of which four were females, and twenty-nine were males, all adults, excepting two boys. They have been disposed of in the following way:—

Rev. G. Ouseley, not operated on, on account of his great age, and the diseased state of the prostate. Four were sent to be operated on by Baron Heurteloup, and three of them were permanently cured. The fourth was operated on three times by him within six months, and twice by me within twelve months; for the last time, four years before his death. He died, aged 76, free from urinary complaint. The detritus was removed (as before stated) by means of the exhausted ball. To this complete removal of the particles I attribute the immunity from relapse during the last four years of his life.

[The lecturer then gives a list of "his own cases," twenty in number, on which lithotrity was performed, and that account is followed by his cases of lithotomy, nine in number, concluding them with the following summary.]

It would appear, then, that the thirty-five cases of stone in the bladder which have applied to me for relief between March, 1834, and November, 1845, have been disposed of in the following way:—

Two (the Rev. G. Ouseley, aged eighty-one, and a gentleman at Coolock) were set aside as unfit for any operation—both had diseased bladder and kidneys; four were sent to Baron Heurteloup, and were cured by lithotrity; twenty were operated on by me, (by lithotrity,) all adults; and nine by cystotomy, three under twelve years of age. Total, 35.

All that were operated on by *lithotrity* were cured, with the exception of one, and in his case the operation cannot be said to have failed, because it was performed expressly to bring the stone into a condition to be removed by lithotomy, and this the operation fully effected. In another case, the cure was not completed, from causes that had no reference to the operation.

All that were operated on by *cystotomy* recovered, though one died three months afterwards of old inflammation of the kidney and testicle; but the wound had nearly healed.

It appears, then, that of the thirty-three patients operated upon, nine only were submitted to cystotomy, (about one-fourth;) it is not, however, to be inferred, that out of any given number of cases of calculus, only one-fourth should be operated on by cystotomy; for if ten or twelve of the twenty-four operated on by lithotrity, instead of being adults, were children and old persons, the proportions might probably be reversed, and the cases suitable to lithotrity might be reduced to ten or twelve, and the difference placed to the credit of cystotomy. And this affords a striking illustration of the utter uselessness (not to say the absolute mischief) of drawing any inference favourable or unfavourable to lithotrity, from a statement of the mere *numbers* operated on, without reference to the *circumstances* of each particular case. The numbers of cases that I have given (I admit) are far from being sufficient to justify any general conclusion as to the respective values of the old and new operations, but they are sufficient to establish some points of great practical importance upon which surgical opinion is still much divided. 1st. It is abundantly proved that lithotrity may be successfully applied to cases which are considered to be beyond the domain of cystotomy. I believe the most intrepid cystotomist would have hesitated (if he did not at once refuse) to operate by cystotomy in four of the cases I have quoted, for it is nearly certain that it would have proved fatal. Another patient, aged sixty-eight, and weighing sixteen stone, would have been a very unfavourable case for cystotomy; he was, however, relieved of his stone (a very large one) by lithotrity, without suffering one hour's confinement. 2dly. In certain cases, to which neither cystotomy nor lithotrity are applicable singly, (as two of my cases proved,) the combination of the two operations (and especially of lithotrity with lithectasy) may be employed with success. Finally, it is proved that when the urinary organs are in a healthy state, stones of great hardness, and upwards of an inch and a half in diameter, may be removed by lithotrity with safety. It by no means follows, however, that, in such cases, lithotrity is *always* to be preferred to cystotomy; the choice of the operation must often be determined by various considerations (not purely surgical) connected with each particular case, and having reference to the operator as well as to the patient. A very skillful cystotomist may not have sufficiently practised lithotrity, and a patient who might make up his mind to suffer one operation, however painful, might be quite unequal to submit to several comparatively slight ones.

But the important question still remains to be determined—a question upon which the cases I have just detailed throw no sort of light—namely, what circumstances forbid lithotrity? It may be stated, as a general fact, that in calculous patients the bladder is not unfrequently found in one of two opposite states, which, if they do not absolutely forbid lithotrity, render its application in the highest degree dangerous, and (as a remedial means) far inferior to cystotomy. The bladder, like the stomach and the heart, has not inaptly been termed a "hollow muscle," which is constantly receiving and transmitting a fluid; like the heart, it is liable to hypertrophy, or thickening of its walls, diminution of its capacities, and increased irritability, or power of contraction; like the heart, too, it is subject to a thinning of its walls, an increase of its capacity, and a diminution of its contractile power: these opposite conditions are easily recognized, and are familiar to every surgeon of experience; but to M. Civiale is due the merit of having shown the influence which these states of the bladder exercise on the success of lithotrity. In the hypertrophied bladder, the patient is harassed by the almost incessant desire to pass water; the quantity discharged seldom exceeds an ounce, or an ounce and a half; the pain, especially in expelling the last drops, is excessive; the urine is always high-coloured, and deposits, on cooling, a mucous sediment, frequently tinged with blood. In such a case, the mere operation of sounding, or even of injecting warm water into the bladder, may excite a severe or even fatal inflammation of the organ. I have knowledge of two cases in which the injection of tepid water into the bladder (though done with the utmost care) proved fatal in three days, by exciting acute inflammation of that organ; on examination after death, the mucous membrane was found inflamed, thickened, and corrugated. In such a state of the bladder, it is scarcely necessary to say that lithotrity is not to be thought of.

The opposite state, in which there is atrophy or wasting of the walls of the viscus, with increase of its capacity (M. Civiale justly observes), exercises a great influence on the sensations which are caused by a calculus as well as upon the manœuvre of the operation, and on its result; it masks all the symptoms of stone, or renders them different from those we are accustomed to observe. As the bladder never empties itself completely, its walls scarcely come in contact with the stone; the consequence is, that the pain and the peculiar sensation in expelling the last portion of the urine (the most certain of the *rational* symptoms of stone) are wanting. Exercise does not cause those bleedings from the bladder, and those painful spasms, of which calculous patients, under other circumstances, complain so much; the urine is loaded, fœtid, and alkaline, the debility increases daily, the pulse is quick and weak, and there are frequent chills, followed by heat flushes—the bladder is in a state of low inflammation, with diminished vital powers, and the kidneys generally participate in the disease. In such a state of things, M. Civiale justly considers that the operation of lithotrity would almost certainly prove fatal; but I believe the same might be said, with equal truth, of cystotomy. He thinks it of so much importance, with reference to lithotrity, that this condition of the bladder should be clearly understood, that, in addition to the signs above mentioned, he gives several others that are deserving of the utmost attention. This morbid thinning and atony of the walls of the bladder must not be confounded with paralysis, or want of action from defect of innervation; this last state furnishes no objection to the application of lithotrity, provided sufficient means be employed to rid the bladder of the fragments of the broken calculus. This is well illustrated by one of my own cases, where the bladder was so completely paralyzed, that for several years the patient had been obliged to draw off the urine by the catheter four or five times in the day.

In addition to the morbid states of the bladder described by M. Civiale, I should say that a contracted and irritable urethra, an enlarged and irritable prostate gland, and, above all, a constitution prone to sympathize with a disordered state of the urinary organs in general, and with the urethra in particular, a large and very hard stone, or numerous small ones, forbid the application of lithotrity, and bring the case within the proper domain of cystotomy.

Lithotrity is in general considered as inapplicable to children under fifteen or sixteen years of age, on account of the narrowness of the urethra in early life, and the comparative safety of cystotomy in young subjects; but considering that in children the urethra is (except at its external orifice) highly dilatable, and that the most violent symptoms of calculus in the bladder are often created by the presence of a stone so small that it might with the greatest facility be crushed, and the fragments extracted, at a single operation, I cannot but hope, that at no distant period the operation of cystotomy will be superseded by lithotrity, in a great proportion of cases of calculus in children. I think that these four calculi [showing them] which I have extracted from infants under six years of age, are the last of the kind that I shall either extract or see extracted by that painful and dangerous operation. But a few days since, Mr. Cusack performed cystotomy on a child of four years of age, in Steevens' Hospital; the moment he divided the membranous part of the urethra, the stone started out into the external incision, and was removed by the fingers of the operator; only the membranous part of the urethra had been opened; the prostate and bladder were untouched. What a triumph it would have been for lithotrity, and what an advancement in operative surgery, if lithotrity had been applied to this case. The bladder not having been opened, the wound was healed in three or four days, and the child was perfectly cured. Nevertheless, it is impossible not to regret, for the sake of the advancement of operative surgery, which is immeasurably improved by everything that renders operations more safe and less painful, that lithotrity had not the merit of this cure.—*Dublin Quarterly Journ. of Med. Sci.*, Feb. 1846.

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50. *Ovarian Dropsy, followed by recovery.*—Mr. R. Eager records in the *Lancet* (Feb. 28) a case of ovarian dropsy, in which the patient had attained the size of a woman at the full period of gestation, the ovarian tumour occupying the abdominal cavity from the pubes to the ensiform cartilage, producing great inconvenience and distress by its pressure on the diaphragm and surrounding viscera, and tapping was regarded as the only probable means of affording relief.

On the 13th November, a purgative was given to relieve constipated bowels—it induced most distressing and violent vomiting, succeeded by rigors and syncope. On the following day a marked change had occurred in her size and form; and, to adopt her own expression,—"She felt a sense of want, sinking, and emptiness, almost amounting to fainting." Early on the morning of the 15th November, Mr. E. was called to her, and found her suffering from all the symptoms of subacute peritonitis, which readily yielded to the usual treatment. On the 17th November a very careful and minute examination of the abdomen failed to detect a vestige of ovarian enlargement, but the whole belly was augmented in size, and over its most dependent parts a very distinct sense of fluctuation was communicated to the hand by percussion. On this day her circumference over the umbilicus was thirty-eight and a half inches. During three or four days subsequent to this date, she evacuated large quantities of urine, to the amount of four, five, and six quarts per diem. On the 22d November her size by admeasurement was reduced to twenty-seven inches, with no perceptible enlargement or fluctuation. From the above time no remarkable symptoms have presented themselves, although her convalescence has been retarded by extreme debility:—this has, however, at length yielded to a generous diet, change of air, and a course of "steel bitter" medicine. She now feels better than at any time during the past four years.

Mr. Eager is induced to believe that the ovarian cyst was ruptured by the violent efforts to vomit on the 13th Nov., that the contents of the sac were extravasated into the abdominal cavity, (producing the attack of peritonitis,) whence they were removed by absorption, the cyst itself remaining in a collapsed and contracted state.

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51. *Ovarian Cysts—Paracentesis* 128 *times.*—Dr. Kirkpatrick exhibited to the Pathological Society of Dublin, Jan. 10th, 1846, the ovaries of a patient who had been a constant patient at the Whitworth and Richmond hospitals during the last five-and-twenty years. She laboured under an ovarian dropsy of immense size, for which she had been tapped 128 times. Her husband was a soldier named Green, whom she had accompanied during the Peninsular War, when she had